

REMARKS

Claims 1-3, 9 and 17 are pending in this application.

By this Amendment, claims 1 and 17 have been amended.

Entry of the amendments is proper under 37 CFR §1.116 since the amendments:

(a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution); (c) satisfy a requirement of form asserted in the previous Office Action; (d) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (e) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

No new matter has been added. Support for the language added to both claims 1 and 17 is found in the original specification. In particular, the language reciting that implanting ions occurs "subsequent to forming the insulation film" can be found on page 16, lines 17-21 of the specification. The language reciting "cleaning or smoothing the surface of said insulation film" can be found on page 17, lines 24-26 of the specification. And the language reciting that the implantation layer is "partly inclined in response to said tapered shape of the outer edge of said ion shield member, so as to prevent separation defect in the semiconductor substrate main body or said support substrate" can be found on page 7, line 17 through page 8, line 10 and page 22 lines 17-21 of the specification.

I. Claim Objection

Claims 1-3, 9 and 17 were objected to because of informalities and/or defects. In particular, in claims 1 and 17, according to the Patent Office the clause "two different depths which are continuous via an inclined portion thereof" appears incomprehensible.

Accordingly, claims 1 and 17 are corrected to remove this language and further clarify Applicants' invention by adding the language "partly inclined in response to said tapered shape of the outer edge of said ion shield member...". Therefore, reconsideration and withdrawal of the claim objection is respectfully requested.

II. Rejection Under 35 U.S.C. §103(a)

A. Bruel '835 in view of Bruel '564 and/or JP '114

Claims 1-3 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bruel, U.S. Patent No. 5,494,835 (hereinafter Bruel '835) in view of Bruel, U.S. Patent No. 5,374,564 (hereinafter Bruel '564) and/or Hirobumi et al, JP 04-025114 (hereinafter JP '114). This rejection is respectfully traversed.

The method of manufacturing a semiconductor substrate according to claim 1 has non-obvious features, in which the method includes the processes of: forming an insulation film on at least a surface of a semiconductor substrate main body; forming an ion shield member having a predetermined shape on said insulation film; subsequent to forming the insulation film, implanting ions into said semiconductor substrate main body from a side on which said insulation film is formed, to thereby form an ion implantation layer; removing said ion shield member; cleaning or smoothing the surface of said insulation film; laminating said insulation film and a support substrate onto each other; and separating said semiconductor substrate main body from said support substrate at a portion of said ion implantation layer, wherein a shape of an outer edge of said ion shield member is tapered, and thereby said ion implantation layer is partly inclined in response to said tapered shape of the outer edge of said ion shield member, so as to prevent separation defect in the semiconductor substrate main body or said support substrate.

(i) *Tapered Ion Shield Member and Tapered Ion Implantation Layer*

None of the references teach or suggest that the ion implantation layer is partly inclined or tapered in response to the tapered shape of the ion shield member as recited in claim 1. In fact, the implanted ions of Bruel '564 are distributed parallel to the surface. See column 5, lines 17-19 of Bruel '564. This teaches against the implantation layer being tapered.

Further, one of ordinary skill in the art would not combine the teachings of JP '114 with either Bruel '564 or Bruel '835 as JP '114 discloses a method to obtain a resist pattern where infrared rays are made to irradiate in a non-oxygen atmosphere after ultraviolet rays have been projected. JP '114 further stresses that the angle of the side wall should be 90° or as close to 90° as possible. JP '114 is not related to the ion implantation disclosed in the present invention.

Applicants submit that the tapered shape of the ion shield member and the ion implantation layer recited in claim 1 is neither taught nor suggested by any of the references.

Therefore, Bruel '835, Bruel '564 and JP '114, individually or in combination, do not teach or suggest the method of manufacturing a semiconductor substrate of claims 1-3.

Reconsideration and withdrawal of the rejection are thus respectfully requested.

(ii) *Cleaning or Smoothing the Insulation Film*

None of Bruel '835, Bruel '564 or JP '114 teach or suggest cleaning the surface of the insulation film. Bruel '835 and JP '114 do not make mention of an insulation film at all. Bruel '564 is the only reference that makes mention of an "encapsulating" layer that can be retained or removed. However, Bruel '564 makes no mention of cleaning or smoothing this "encapsulating" layer if used.

Applicants submit that cleaning or smoothing the surface of the insulation film as recited in claim 1 is not taught or suggested by any of the references.

Therefore, Bruel '835, Bruel '564 and JP '114, individually or in combination, do not teach or suggest the method of manufacturing a semiconductor substrate of claims 1-3.

Reconsideration and withdrawal of the rejection are thus respectfully requested.

(iii) *Formation of Insulation Film Prior to Ion Implantation*

Furthermore, Bruel '835, Bruel '564 and JP '114 do not teach or suggest, individually or in combination, the invention recited in claims 1-3. Applicants submit that formation of insulation film prior to ion implantation is not taught or suggested by the references individually or in combination.

Therefore, reconsideration and withdrawal of the rejection are thus respectfully requested.

B. Bruel '835 in view of Bruel '564 and/or JP '114
and further in view of Fukunaga

Claim 9 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bruel '835 in view of Bruel '564 and/or JP '114 and further in view of Fukunaga, U.S. Patent No. 6,271,101 (hereinafter Fukunaga). This rejection is respectfully traversed.

Fukunaga does not remedy any of the deficiencies of Bruel '835, Bruel '564 and JP '114 discussed above. In particular, a tapered ion shield member and a tapered ion implantation layer, cleaning or smoothing the insulation film, or formation of the insulation film prior to ion implantation according to the embodiment recited in claim 1 is nowhere taught or suggested by Bruel '835, Bruel '564, JP '114 or Fukunaga.

Claim 9 directly depends on allowable claim 1 and is thus also allowable. Therefore, reconsideration and withdrawal of this rejection are respectfully requested.

C. Bruel '835 in view of Bruel '564 and/or JP '114 and further in view of JP '195

Claim 17 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bruel '835 in view of Bruel '564 and/or JP '114 and further in view of Kunihiro et al., JP 05-313195 (hereinafter JP '195). This rejection is respectfully traversed.

JP '195 does not remedy any of the deficiencies of Bruel '835, Bruel '564 and JP '114 discussed above. In particular, a tapered ion shield member and a tapered ion implantation layer, cleaning or smoothing the insulation film, or formation of the insulation film prior to ion implantation according to the embodiment recited in claim 17 is nowhere taught or suggested by Bruel '835, Bruel '564, JP '114 or JP '195.

Therefore, reconsideration and withdrawal of this rejection are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-3, 9 and 17 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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